Nutrition Guidelines for Diabetes

I. Goals of Nutrition Management

- Maintain as near-normal blood glucose as possible by balancing food intake with insulin or oral blood glucose-lowering medications and physical activity.

- Provide adequate calories for normal growth and development rates in children and adolescents.

- Prevent and treat complications of diabetes including hypoglycemia and abnormal serum lipid levels.

- Improve overall health through good nutrition.

II. Individualized Meal Planning

All people with diabetes should meet with a registered dietitian or nutrition counselor specialized in diabetes to individualize their meal plan based on their nutritional needs and usual eating habits.

A. The calorie level of the meal plan is based on individual needs for growth and development as well as their physical activity level.

   Children and adolescents, even if overweight, should not have calories restricted that could limit their normal growth and development.

B. Spacing of food intake, particularly carbohydrate foods, throughout the day is key to blood sugar control. The *amount* and *timing* of carbohydrate foods should be balanced with physical activity and insulin or oral medication.

C. The type of carbohydrate is no longer restricted in the diabetic diet. For years, sugar (sucrose) was omitted and starches were preferred to natural sugars (lactose and fructose) found in milk and fruit. Scientific evidence has shown that all carbohydrates are digested and absorbed at similar rates. All carbohydrates are now counted as equal in terms of blood sugar regulation.

Carbohydrate foods are now interchanged using the amount of 15 grams for one serving of carbohydrate in a meal plan. Preference is given to whole grains, fruits, vegetables, and "low fat" milk because of their nutritional value, not because of the type of carbohydrate they contain.

III. Nutrition Recommendations

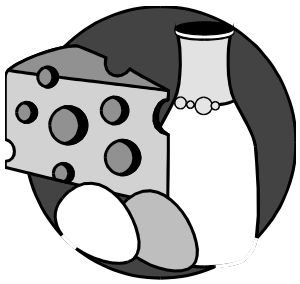
The Dietary Guidelines for Americans provides nutrition recommendations for health and disease prevention. Nutrition recommendations for children and adolescents include:

- Aim for a healthy weight by choosing sensible portions and being physically active every day.

- Eat at least 5 servings of vegetables and fruits every day.

- Choose a variety of grain foods, especially whole grains.

- Choose plenty of calcium rich foods including milk and milk products each day.



- Choose a diet that is moderate in total fat and limited in saturated fat and cholesterol.

- Limit beverages high in sugar.

- Moderate the use of salt.

- Avoid alcoholic beverages. Alcohol may cause hypoglycemia; risk is increased if taking insulin or sulfonylureas.

IV. Meal Planning Approaches

A meal pattern provides the *framework* for making food choices. Key to all meal plans is controlling the amount and the spacing of carbohydrate foods eaten throughout the day. Carbohydrate foods include milk, starches, fruits, and other high carbohydrate foods (i.e. sweets).

- **Exchange Lists for Meal Planning** is a frequently used approach. Meal plans specify the number of servings from each food group that should be eaten at each meal and snack. Food groups list measured amounts of foods that may be exchanged for one another and provide similar calorie, carbohydrate, protein, and fat content.

  Nutrition guides and exchange information for fast food restaurants and national chains are available at: http://www.diabetes.about.com/cs/nutriondiet/a/fast_food_guide.htm/

- **Carbohydrate counting** This approach counts only grams of carbohydrate in foods. It is used when greater simplicity and flexibility are desired. Insulin amounts may be adjusted before each meal based on the grams of carbohydrate at that particular meal.

  The Joslin Diabetes Center at Harvard University has created web-based materials on carbohydrate counting. *"Carbohydrate Counting: As easy as 1-2-3"* can be accessed at: http://www.joslin.harvard.edu/education/library/wcarbsug.shtml/

- **Diabetes Food Pyramid** differs from the USDA's Food Guide Pyramid by grouping starchy vegetables and dried beans with the grain foods because of their similar carbohydrate content. See page 63 for a copy of the Diabetes Food Pyramid.

Eating Healthy

With the Diabetes Food Pyramid

The Diabetes Food Pyramid has six food group sections. The largest group - grains, beans and starchy vegetables - is on the bottom and serves as the base of the pyramid. This means that you should eat more servings from this group than of any of the other food groups. The smallest group - fats and sweets - is at the top of the pyramid, emphasizing that you should eat less of these foods.

The number of servings you need from each food group depends on your nutrition needs, your lifestyle, and the foods you like to eat. For a healthy meal plan that is based on your individual needs, you should work with a registered dietitian (RD). The following chart shows a sample number of servings from the pyramid food groups for different calorie needs. Carbohydrate food groups (marked as *) may be interchanged.

Daily Calories	**1500**	**1800**	**2000**	**2200**	**2500**
*Grains, Beans and Starchy Vegetables	7	9	10	11	12
Vegetables	3-5	3-5	3-5	3-5	3-5
*Fruits	3	3	3	4	4
*Milk, skim	2	3	3	3	4
Meat	2	2	2-3	2-3	2-3
Fats	4	5	6	6	8
*Sweets	Substitute by counting each 15 grams of carbohydrate for one serving of a carbohydrate food group.				

Keep your blood sugar at a healthy level each day.

- Divide your food intake evenly throughout the day into regular meals and snacks.
- Distribute carbohydrate foods so that about the same amount of carbohydrates are eaten at about the same times each day.
- Do not skip meals or snacks.

Eating Healthy
With the Diabetes Food Pyramid

Sample 1800 Calorie Meal Pattern

Meal Pattern:

Breakfast
- 2 starch
- 1 fruit
- 1 milk
- 1 fat

Morning Snack
- 1 starch and 1 fruit

Lunch
- 1 meat
- 1 starch
- 1 vegetable
- 1 fruit
- 2 fat
- 1 milk

Afternoon Snack
- 1 starch

Supper
- 2 starch
- 3 vegetables
- 1 meat
- 4 fat

Evening Snack
- 1 fruit, 1 milk

Sample Menu:

Breakfast
- 1/2 cup oatmeal
- 1 slice toast
- 1/2 cup orange juice
- 1 cup skim milk
- 1 teaspoon margarine

Morning Snack
- 3 graham cracker squares
- 1 small apple

Lunch
- 2 slices whole wheat bread
- 2 teaspoons mayonnaise
- 1 cup carrot and celery sticks
- 1 orange
- 2-3 oz sliced ham
- 1 cup skim milk

Afternoon Snack
- 4-6 crackers

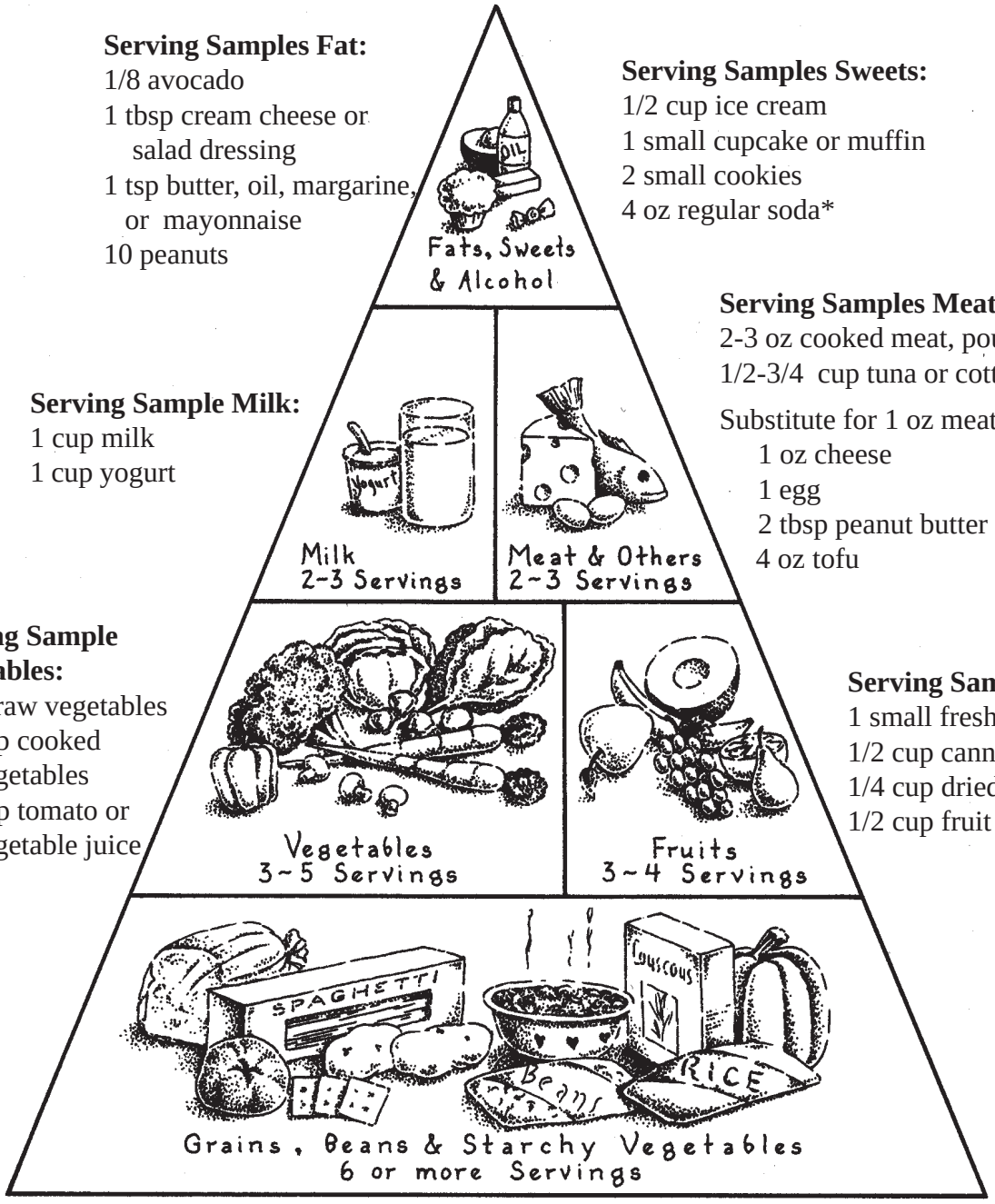
Supper
- 2-3 oz chicken
- 1/2 cup potatoes
- 1/2 cup corn
- 1/2 cup green beans
- 1/2 cup tomato juice
- 2 teaspoons margarine

Evening Snack
- 1/2 cup peaches (light syrup)
- 1 cup skim milk

The Diabetes Food Pyramid

Serving Samples Fat:
1/8 avocado
1 tbsp cream cheese or salad dressing
1 tsp butter, oil, margarine, or mayonnaise
10 peanuts

Serving Samples Sweets:
1/2 cup ice cream
1 small cupcake or muffin
2 small cookies
4 oz regular soda*



Serving Sample Milk:
1 cup milk
1 cup yogurt

Serving Samples Meat & Others:
2-3 oz cooked meat, poultry, or fish
1/2-3/4 cup tuna or cottage cheese

Substitute for 1 oz meat:
1 oz cheese
1 egg
2 tbsp peanut butter
4 oz tofu

Serving Sample Vegetables:
1 cup raw vegetables
1/2 cup cooked vegetables
1/2 cup tomato or vegetable juice

Serving Samples Fruits:
1 small fresh fruit
1/2 cup canned fruit
1/4 cup dried fruit
1/2 cup fruit juice

Serving Samples Grains, Beans, and Starchy Vegetables:

English muffin or pita bread	1 slice bread	1/2 small bagel
1/2 hamburger or hot dog bun	1 6-inch tortilla	4-6 crackers
1/2 cup cooked cereal, pasta, or bulgur	3/4 cup dry cereal	1 small potato
1/2 cup cooked sweet potato	1/2 cup cooked rice	1 cup wintersquash
1/2 cup cooked beans, lentils, peas, or corn		

* The American Academy of Pediatrics discourages the use of soda in the school setting. (Soft Drinks in School. *Pediatrics*.113(1): 153 154.2004).

Classroom Snacks

Room parties and birthday celebrations frequently bring snacks into the classroom. Sugar sweetened foods, once considered “taboo” for children with diabetes, may be included with careful planning.

Carbohydrate food groups include Grains, Beans and Starchy Vegetables, Milk, Fruit, and Sweets. The type of carbohydrate you eat is not as important as once believed. It is the amount and the spacing of carbohydrates throughout the day that is key to diet control of blood sugar. Sweets may be included if substituted for other foods that contain similar amounts of carbohydrates. To help with substitutions, the amount of a food that contains approximately 15 grams of carbohydrate is considered one carbohydrate food group serving.

Help children learn to celebrate with games, contests, and adventures, instead of focusing on food as many adults do. Celebrate by offering non-food treats, such as stickers, pencils, pens, crayons, and party favors.

When sweets are served, choose ones with healthy ingredients when possible. Sweets that include whole grains and fruits, such as oatmeal raisin cookies or carrot muffins, add fiber and important nutrients.

To encourage healthy eating habits for all children, serve low sugar snacks, such as graham crackers, fruit chunks, and vegetable sticks.

Examples of Snack Substitutions are provided on pages 65-66.

Snack Substitutions

PLEASE CHECK ALL NUTRITION LABELS TO VERIFY THE AMOUNT OF CARBOHYDRATES IN EACH SERVING. If unsure, contact your food service manager.

Snack/Sweet	Serving Size	Carbohydrate Servings*
Brownie: no icing	2 " square	1
frosted	2 " square	2
Cake: no icing	2 " square	1
frosted	2 " square	2
Candy bar: snack size	1 bar (1 oz)	1
miniatures	3	1
Candy, hard	3 round pieces	1
Chips, potato or tortilla	10-15 chips (1 oz)	1
Chocolate kisses	5	1
Cookie	3 inch	1
Crackers, snack	4-5	1
Cupcake: no icing	1 small	1
frosted	1 small	2
Doughnut: plain cake	1 med (1½ oz)	1½
glazed	3 inch (2 oz)	2
Fruit: canned	½ cup	1
fresh	1 small	1
Fruit juice 100%	4 oz	1
Fruit juice bars, 100% juice	1 (3 oz)	1

*15 grams of carbohydrate = 1 carbohydrate serving

Snack Substitutions

PLEASE CHECK ALL NUTRITION LABELS TO VERIFY THE AMOUNT OF CARBOHYDRATES IN EACH SERVING. If unsure, contact your food service manager.

Snack/Sweet	Serving Size	Carbohydrate Servings*
Fruit snacks, chewy	1 roll (3/4 oz)	1
Gelatin, regular	½ cup	1
Gingersnaps	3	1
Granola bar	1 (1 oz)	1
Graham crackers	3 squares	1
Ice cream	½ cup	1
Frozen yogurt	½ cup	1
Muffin	1 small	1
Popcorn, popped	3 cups	1
Pretzels, mini twists	15 (3/4 oz)	1
Pudding: no added sugar	½ cup	1
regular	½ cup	2
Soda: regular	4 oz	1
diet	4 oz	0
Vanilla wafers	5	1
Vegetables – non starchy	3 cups raw	1
Vegetable juice	4 oz	1
Yogurt, sweetened fruit	1 cup	3

*15 grams of carbohydrate = 1 carbohydrate serving

Eating Disorders and Diabetes

An eating disorder is a serious emotional and physical illness that can have life-threatening consequences, especially for children and adolescents with diabetes. Eating disorders—such as anorexia, bulimia, and binge eating disorders—are very complex conditions that require professional help.

Although each type of eating disorder has unique characteristics, all involve the control and manipulation of food and body weight in an attempt to cope with underlying feelings and emotions.

ANOREXIA NERVOSA is characterized by self-starvation and excessive weight loss.

Symptoms include:

- Refusal to maintain body weight at or above a minimally normal weight for height, body type, age, and activity level
- Intense fear of weight gain or being "fat"
- Feeling "fat" or overweight despite dramatic weight loss
- Loss of menstrual periods
- Extreme concern with body weight and shape

BULIMIA is characterized by a secretive cycle of binge eating followed by purging. Bulimia includes eating large amounts of food—more than most people would eat in one meal—in short periods of time, then getting rid of the food and calories through vomiting, laxative abuse, or over-exercising.

Symptoms include:

- Repeated episodes of binging and purging
- Feeling out of control during a binge and eating beyond the point of comfortable fullness
- Purging after a binge, (typically by self-induced vomiting, abuse of laxatives, diet pills and/or diuretics, excessive exercise, or fasting)
- Frequent dieting
- Extreme concern with body weight and shape

BINGE EATING DISORDER (also known as COMPULSIVE OVER-EATING) is characterized primarily by periods of uncontrolled, impulsive, or continuous eating beyond the point of feeling comfortably full. While there is no purging, there may be sporadic fasts or repetitive diets and often feelings of shame or self-hatred after a binge. People who overeat compulsively may struggle with anxiety, depression, and loneliness, which can contribute to their unhealthy episodes of binge eating. Body weight may vary from normal to mild, moderate, or severe obesity.

Complications

Severe medical conditions that can occur with eating disorders include electrolyte imbalance, irregular heartbeat, low blood pressure, thinning of the walls of the heart, osteoporosis (brittle bones), hair loss, tooth erosion, gum problems, and swelling of the salivary glands.

Compulsive eating without purging leads to obesity, a risk of high blood pressure, high blood cholesterol, gallstones, heart attack, stroke, respiratory problems, and often, diabetes.

Eating Disorders and Diabetes
The management of diabetes may create a preoccupation, even an obsession, with food. Diabetes can lead someone to see food as dangerous, something to avoid. Worrying about eating the wrong foods, or classifying certain foods as either good or bad are unhealthy mindsets that can influence the development of an eating disorder.

Having diabetes may also trigger psychological factors that influence the development of eating disorders, including low self-esteem, feelings of inadequacy or lack of control in life, depression, anxiety, anger, or loneliness. The child or adolescent with diabetes may use excessive control of their food and weight as a means of dealing with these emotions and feelings. For teenagers with diabetes, feelings that their families are overly involved in their lives may trigger rebellion and a fight to become independent at almost any cost.

Teens learn quickly that poor glucose control leads to weight loss and that improved glucose control can lead to weight gain. The long-term consequences of high glucose levels are seen as being less important than the immediate rewards of weight loss or maintenance.

A major concern regarding eating disorders and diabetes is that the eating disorders may go undetected until serious complications have developed. Weight loss resulting from an eating disorder may be passed off as the result of careful diabetes control. Skipping or cutting back on insulin can mask binge eating.

Diabetes Dangers
Because people with diabetes and an eating disorder have unhealthy blood glucose levels over a long period of time, they are at great risk for diabetes complications that can affect every system of the body.

Hypoglycemia (low blood sugar) is a risk when food is restricted, meals are skipped, or food is purged.

Hyperglycemia (high blood sugar), severe enough to bring on ketoacidosis, which can lead to death, may occur if insulin is skipped or the dose of insulin reduced.

Prevention
The following recommendations can help minimize the influence of diabetes management in development of eating disorders.

- Focus on food choices rather than food restrictions. All foods, including sweets may be worked into a diet for diabetes with planning. (See Classroom Snacks, under Nutrition Section for substitutions).

- Don't expect perfection in diet compliance.

- Avoid emotional or judgmental labels for foods or eating behaviors. Do not categorize foods as "good or bad", or say that a person is "good or bad" based on how or what they eat.

• Make sure that a child's or adolescent's meals and snacks include foods that he/she enjoys and allows for their favorite foods to be included. • Avoid making the person with diabetes feel different. Singling them out may result in feelings of isolation and loneliness.	Recommend consultation with a Certified Diabetes Educator or a Registered Dietitian if you feel that the meal plan needs adjusting to meet the individual's needs or food preferences. For more information, contact *Eating Disorders Awareness and Prevention, Inc.* at 603 Stewart St., Suite 803, Seattle, WA 98101

504 Dietary Plan

Section 504 of the Rehabilitation Act of 1973 assures handicapped students access to school meal service, even if special meals are needed because of their handicap.

"Handicapped student" means any student who has a physical or mental impairment, which substantially limits one or more life activities, has a record of such an impairment, or is regarded as having such an impairment.

If special meals are needed and requested, certification from a medical doctor or health care provider must 1) verify that special meals are needed because of the handicap, and 2) prescribe the alternate foods and forms needed.

Completion of the following by a student's physician or health care provider will provide the necessary certification:

NAME OF STUDENT FOR WHOM SPECIAL MEALS ARE REQUESTED:

_____

Food Prescribed	Form Allowed (e.g. fresh, baked, ground, blended, etc.)
Meat & meat alternates	
Milk & milk products	
Bread & cereal	
Fruits & vegetables	

Other Dietary Information and Directions

I certify the above named student is in need of special school meals prepared from the above-indicated foods and forms because of a handicap.

_____ _____

Physician or Health Care Provider's Signature Date

Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

- Meal Plan Sample on Back –

Meal Plan Sample

Be sure to communicate with your food service manager to confirm the nutrition content of meals.

Meal Plan (Calories) _____ Date _____

Time	Number of Exchanges/Choices	Total Carbohydrate Grams
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	

* Starches include grains (rice, bread, pasta, etc.), beans, starchy vegetables, and foods listed as "other carbohydrates" on the diabetes exchange lists.

The Joslin Diabetes Center at Harvard University has created web-based materials on carbohydrate counting. *"Carbohydrate Counting: As easy as 1-2-3"* can be accessed at:
http://www.joslin.harvard.edu/education/library/wcarbsug.shtml/